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ABSTRACT

This paper focuses on the challenge raised by the acquired immunodeficiency syndrome (AIDS) epidemic regarding the need to improve the effectiveness of health communication or education campaigns. The paper discusses the behaviors underlying health information processing and particularly what is called the "knowledge but not behavior-change phenomenon" and the importance of managerial structure in the conceptualization, design, and evaluation of health information or education programs. The paper advances the argument that an integrative model based on systems theory would serve researchers and planners better than micro-level models dealing with Knowledge, Affect, or Practice (KAP) variables, opinion- or attitude-holding, attitude-change processes or even health beliefs taken by themselves. The paper argues that systems theory represents a larger scale theory that offers the potential for integrating smaller theories fruitfully. The latter part of the paper deals with the application of segmentation and Management by Objectives (MBO) principles. Two tables of data are included; 93 references are attached. (RS)

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BEHAVIORAL AND MANAGERIAL MODELS THAT CAN HELP IMPROVE AIDS CAMPAIGN PLANNING

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INTRODUCTION

This paper focuses on the challenge raised by the Acquired Immunodeficiency Syndrome (AIDS) epidemic regarding the need to improve the effectiveness of health communication or education campaigns.

The first part of the need centers on behaviors underlying health information-processing and particularly what we call the "knowledge but not behavior-change phenomenon." The second part centers on the importance of managerial structure in the conceptualization, design and evaluation of health information or education programs.

The paper advances the argument that an integrative model based on systems theory would serve researchers and planners better than micro-level models dealing with KAP (Knowledge, Affect or Practice) variables, opinion- or attitude-holding, attitude-change processes or even health beliefs taken by themselves.

Systems theory represents a larger-scale theory that offers the potential for integrating smaller theories fruitfully.

The latter part of the paper deals with the application of segmentation and Management By Objectives (MBO) principles.

INFORMATION VS. BEHAVIOR CHANGE

Both information and misinformation about AIDS and Human Immunodeficiency Virus (HIV) contagion are widespread in the United States, as a recent national survey by the National Center for Health Statistics (Boston Globe, 30 January 88, p. 7) revealed:

- Regarding correct information-holding, more than 99 percent of the respondents had heard of AIDS, 93 percent believed it was "very likely" a person could get HIV by sharing IV drug needles with an infected person, 78 percent knew it could be spread by sexual intercourse, and 73 percent knew an infected mother could pass the virus to her baby during pregnancy.

- Regarding what epidemiologists believe to be erroneous information-holding, 69 percent said kissing with exchange of saliva could transmit HIV infection, 36 percent thought they could get the virus by eating at a restaurant where a cook was infected, 35 percent believed the AIDS virus could be spread by mosquitoes or other insects, 24 percent believed they could get the AIDS virus by donating blood, and 18 percent believed

they could get HIV by working near an infected person.

Those figures relate to a general population sample--which is to say that the information/ misinformation situation within population segments that are at high risk still is largely open to speculation. The classic Cincinnati study by Hyman and Sheatsley (1947) indicates that even saturation coverage by media fails to inform all segments of a population. Moreover, the knowledge gap studies (e.g., Tichenor, Donohue & Olien, 1970) have attempted to explain why when members of a population presumably are equally exposed to information, some inevitably learn less than others.

The NCHS data above also raise the question why some information seems to have been learned relatively effectively by the total population, while other information was not. Selectivity theory (consult Davison, Boylan & Yu, 1976, pp. 131-157) provides some clues, but hardly a satisfactory explanation.

Furthermore, information or education is not a sufficient condition, causally, for the adoption of salutary behaviors. As Leishman (1987, p. 40) points out:

> The concept of behavioral control over health now seems a commonplace...[but] evidence that people are willing to change their behaviors remains unconvincing. AIDS may provide the ultimate test of strategies for behavioral modification.

In one of the earliest studies of mass media impact on knowledge and behavior change in regard to smoking, O'Keefe (1971) found that while 63 percent of the student smokers and

73 percent of the smokers in his general population sample agreed that smoking was injurious to one's health, two-thirds had not changed their smoking behaviors. O'Keefe commented that psychological congruence theory wasn't working: The fact that smokers recognized a behavior as harmful didn't effect behavioral change.

In the case of AIDS, there are indications--some from anecdotal reports and some from structured research--that there is considerable ambivalence about implementation of protective behaviors against AIDS virus infection (as examples, see Newsweek, 24 November 86, pp. 40-42).

There are several reports about sexually transmitted diseases, especially AIDS, that lend support to O'Keefe's observation that information transmitted by the mass media is not a sufficient condition, causally, for behavior change (see, for example, Simkins & Everhage, 1984; Boston Globe, 12 November 86, p. 1; Leishman, 1987, pp. 39-58; U.S. News and World Reports, 12 January 87, p. 68, and Time, 16 February 87, p. 59, Norton & Hughey, 1987, People, 13 April 87, pp. 111-121.)

However, some reports on health communication and behavior change suggest a more optimistic view.

One Gallup survey indicates some movement toward either condom use or more selectivity in regard to partners, though 80 percent of the respondents reported little to no personal worry about AIDS (Newsweek, 24 November 1986, pp. 32-33).

In secondary analysis of a survey on sexual behavior that dealt with herpes, only 19 percent of the sample perceived themselves at risk of getting herpes, and 45 percent of those reported they had modified their sexual behaviors in an attempt to protect themselves (Aral, Cates & Jenkins, 1985).

Even Fineberg (1988), who is more sanguine about the prospects for public health education as a means of controlling the spread of AIDS points out that in some cases the information that is being transmitted is misleading--e.g., sporadic use of condoms as barriers against the AIDS virus produces markedly less protection than use of condoms during every act of intercourse.

Over-all, actual public health communication and health education practices seem to be anchored philosophically in the pre-1950s, when there was relatively greater faith that audiences were, in the main, passively receptive and malleable.

SYSTEMS THEORY

Systems theory, discussed by Buckley (1967), is based in the notion that complex phenomena can be described in terms of a system that is made up of units that are interrelated functionally in the service of some objective or objectives.

Communication, in general, provides the linkages that make the organization possible. Communication also serves systems maintenance--that is, meeting surveillance or feedback needs, energizing, coordinating, and moderating dysfunctions.

Systems maintenance deals in the largest part with tension in the system. Tension is a form of energy. It can be equated logically to drive, as conceptualized by Freud (Weiner, 1980). The relationship in the system between tension, on the one hand, and productivity or change, on the other, can be seen as essentially curvilinear, taking the form "$\cap$": Low tension levels tend to produce stasis, or lack of productivity or change. High tension levels also tend to produce stasis. Intermediate levels of tension tend to favor productivity or change. An analogy to stress and task performance is appropriate: with little or no stress, inactivity or poor performance may result; moderate levels of stress contribute to productivity; high levels of stress usually reduce performance efficiency.

Systems theory also posits that units in the system have opportunities and limitations.

It is implicit that there is some sort of elaborated rule structure that explains how the particular system functions or should function. The lack of attention by theorists to the notion of system rule structure as it affects information-processing and motivation as they bear upon behavior change has been one of the major deficiencies discouraging applications of systems theory in the communication field.

Systems theory offers particular advantages in relation to research concerning health communication:

- It can be utilized at the individual level as well as at more encompassing levels, i.e., community or larger

society.

(In the theory, units in a large system can be viewed as organized hierarchically, with subsystems subsumed under suprasystems that are more embracing; or a large system may considered the suprasystem to a number of subordinate subsystems.)

- It lends itself to differentiation of health concerns and the rules that control health information-processing and behavior-change in different subsystems (target audience segments).

- It is relatively value-neutral in that it is oriented toward determining how and why any particular system functions--accepting that even though practices in a particular system might seem "illogical" to an outsider to the system at first observation, there usually is a rule structure that is logical to the system that is under examination. (This makes systems theory particularly attractive for those persons who are interested in health communication in different cultures.)

- It makes it possible to incorporate effects of interrelated systems that may control what health planners call facilitating or enabling variables--e.g., the impact of federal government system cutbacks on funding for methadone programs, which eventually can complicate or negate education program efforts designed to convince illegal IV drug users to substitute a drug treatment for drug abuse.

Notably, systems theory can make researchers, planners and communication or education practitioners aware of the complexity of health information processing and decisionmaking. It helps address some of the problems associated with traditional research approaches:

- The first two of the KAP variables describe contingent conditions in the human information-processing system and the third describes potential observable outcomes, but if the latter outcomes do not obtain, the scheme is not conducive to

understanding why knowledge and affect did not produce the observable practice that one would infer should occur.

• Self-reports on health practice changes also must be considered to be suspect--e.g., percentages of persons asserting that they have changed their sexual practices in relation to news about the AIDS epidemic. First, it must be weighed whether the "halo effect"--with answers being tailored to appear socially aware or concerned--might inflate the reportage. Second, consideration must be given to the degree to which the reported change occurs in high-risk groups. Third, when change is reported or does occur in health behaviors, that must not be assumed to be continuing or self-perpetuating any more than any other adoption--since discontinuation does occur (Rogers & Shoemaker, 1974).

• Opinion is not an overly helpful construct due to the facts that (1) opinion without supporting knowledge or correct knowledge is common (Lane & Sears, 1964, pp. 57-71)--with this situation apparently being more common in some cultures than others; and (2) opinion does not assume that the individual knows how to implement health behaviors even where concern is expressed over an issue, a problem that McGuire (1980) cited.

• Attitude also does not, in itself, provide much more help--especially where attitudinal measures are not proved to have criterion validity. The problem is not unlike that of predictive powers of "locus of control" scales, discussed by Phares (1978): where scale items are more general than domain-

specific, the scales tend to produce correlations, but the coefficients usually are of small magnitude even though they might be statistically significant. Additionally, attitude-change theory--particularly balance, homeostasis, congruity and cognitive dissonance--has been used at times as though it were a class of motivational theory (Insko et al., 1975). However, the problem cited by O'Keefe (1971, p. 248) about the lack of change in health behaviors in the face of knowledge about the need to change is typical of the problem of the utility of attitude-change theory in explaining behavior. Actually, as will be discussed later, there are beliefs which usually are disregarded by researchers that more or less serve as "on/off" switches that can neutralize the potential effects of lack of psychological congruity.

BELIEFS AS SYSTEM RULES

The behavioral construct of belief (see Rokeach, 1972, and Fishbein & Ajzen, 1975) provides a better way of understanding humans' information-exposure, information-processing and behavior implementation processes in the health area.

Beliefs are subjective (personal) probability estimates that originate in information (Fishbein & Ajzen, 1975, pp. 131-215):

- **Experiential beliefs:** From direct experience.
- **Source beliefs:** From other people, mass media or institutions.

- **Derived beliefs:** From generalization based on other beliefs.

A tentative inventory of categories of beliefs that relate to health behaviors includes:

(1) The individual's knowledge about his/her world,

(2) what attributes classify what phenomena--including ones that differentiate phenomena,

(3) what things are called,

(4) how things are related,

(5) assumptions about causality,

(6) what things are "true" or not,

(7) what things are important in one's own life (as opposed to important in a general sense),

(8) how things are accomplished or attained,

(9) whether one has personal control over, or personal responsibility for, his/her behaviors,

(10) what information sources are useful and credible,

(11) what factors external to the individual pose real limits or opportunities for behaviors the individual might pursue.

BELIEFS AS SYSTEM RULES: Beliefs can be equated to the articulated rules that govern the system in regard to (1) information-seeking or exposure, (2) information-holding, (3) information processing and (4) motivational processes.

Artificial intelligence, a specialized field of computer simulation that is modeled on human thought processes, also uses the notion of "rules" and "scripts" to explain to a computer about how humans think and act.

Additionally, Shimanoff (1981) has written about human use of rules in communication behavior.

INCREASING CONCERN WITH BELIEFS: In the effort to explain change processes in health education campaigns (or lack of change), the construct of beliefs has become increasingly important.

The seminal work for most of this has been Lewin's writing (Lewin, 1935; Cartwright, 1951, Weiner, 1980) on "life space" and field theory. First, it is argued that individual reacts to possible goals (later also called rewards or outcomes) and that those goals have valences (strengths of attractiveness or aversiveness). Second, it is argued that the individual's movement toward positively valenced goals is affected by "life space" experiences (i.e., beliefs) concerning the attainability of the goals (see Weiner, 1980, for concise explanation).

BELIEF/DISBELIEF SYSTEMS: Rokeach (1972) contributed to the systems-based conceptualization of beliefs as being structured in "belief" and "disbelief" subsystems that the individual uses in responding to phenomena.

In the situation of AIDS, for example, it can be argued that failure to change behavior in face of the epidemic could

result from articulated disbelief systems--e.g., "This is media hype," "No one I know has AIDS, so I'm not at risk," "If there is such a disease, science will find a cure," etc.

Similarly, the findings from the National Center for Health Statistics cited earlier concerning erroneous beliefs about the spread of the AIDS virus can be explained in terms of disbelief systems--e.g., "If AIDS really is plague-like, as they say, it ought to parallel other diseases in relation to spread by means other than sexual intercourse and IV drug abuse."

BELIEFS AND HEALTH MODELS: The Health Beliefs Model (Rodenstock, 1974) embodies thinking similar to that of Rokeach (1972) in that it is generally held that specific beliefs and disbeliefs are correlated with implementation of behaviors--in this case, health behaviors.

Moreover, the Decisional Balance Model (see Janis, 1959; Jannis & Mann, 1968, Janis & Mann, 1977) seems to parallel Rokeach's (1972) notions that interaction between beliefs and disbeliefs is instrumental to the explanation of health behavior decisions.

One apparent weakness of the Health Beliefs Model and the Decisional Balance Model has been methodological: how to isolate the beliefs that are critical. In a causal sense, it is one thing to identify variables that might be contributory vis-à-vis some outcome. It is a more complex matter to identify the ones that are critical to explanation and prediction.

BELIEFS AND HEALTH MOTIVATION: Value-Expectancy Theory, which is mainly associated with Rotter (see Weiner, 1980, for overview and Fishbein & Ajzen, 1975, for alternative formulations), either parallels or follows Lewin's work.

Value-expectancy is a form of motivational theory. It holds that a behavioral expectation (which is like a motivational force) is a function of the individual's belief that a situation (1) has a valenced outcome--i.e., that it is important to the individual--and that (2) the valenced outcome is attainable or is attainable through some prescribed means. In other words, there are beliefs about goals and beliefs about whether some behaviors can prove instrumental to goal-attainment.

(Interestingly, Rokeach [1972] evolved a similar analytic framework to explain behaviors: end-state values and instrumental values. The first is similar to valenced outcomes and the second relates to modes of behavior that will help produce the end-states that are valued by the individual.)

In the AIDS case, it is clear there are positively or negatively valenced goals or outcomes--e.g., maintaining one's health, preventing harm to loved ones, enjoying sexual pleasure, enjoying a drug-induced high, feeling "macho," etc. Also, there are other beliefs--e.g., "Condoms sometimes break," "None of this is relevant"--that explain instrumentality judgements. It seems implicit that (1) individuals' beliefs constitute the "rules" for creating decisional motivation and

(2) there is a decisional comparison of weighted "pro" and "con" dimensions concerning the behavior under consideration.

SUBSYSTEM DIFFERENCES: What is increasingly clear is that different audience segments in a population--or, in systems terms, subsystems within the larger social system--act through their beliefs to assign different import to the rewards and information (see Simmons, 1987, regarding methodology).

Moreover, there are indications that health beliefs and their imports vary across ethnic groups (Auah, 1985)--which, in systems theory, might be another way of delineating subsystems.

The observations in the paragraph above explain one perhaps formidable weakness in the failure to use segmentation in some health communication or education campaigns--such as the U.S. Centers for Disease Control's official federal AIDS campaign: When segment or subsystem health belief differences are not considered, and message systems are designed for a "general audience"--i.e., the system as an entirety--the relevance and motivational impact are, logically, weakened.

That also might help explain the selectivity phenomenon within and across subsystems such as target segments.

Moreover, beliefs about what terms are appropriate to describe phenonena or about what attributes classify phenomena can vary across subsystems. An insight gained from our earlier research on the AIDS epidemic and campaigns in Latin America (Simmons, Lee & Ludeman, 1988) was that in at least one country

males who engaged in anal sex with other males did not consider themselves homosexual in any way because they believed they did not have attributes they associated with gays, such as effeminate or submissive conduct.

BELIEFS THAT NEGATE TENSION FAVORING CHANGE: Much attention has been paid to so-called attitudinal change models. Most assume, as did O'Keefe (1971, p. 248) that a psychological imbalance--equivalent, in systems theory terms, to system tension--resulting from opposed cognitions ("I know I smoke" and "I know smoking is dangerous") should have produced a stress (much like a motivational force) to change.

Although O'Keefe (1971, p. 248) opined that perhaps individuals simply live with stress instead of changing their behaviors, Insko et al. (1975) provide a better explanation. The authors draw upon psychological balance theory's father, Fritz Heider, who used a concept he called "unit relationship." If a situation involving opposed cognitions theoretically should produce a stress to change, it might be cancelled out by a lack of unit relationship (i.e., non-linkage beliefs).

In this case, it might be "it's risky for others, but not for me," "I'm habituated, so I can't change," "'They' have me hooked," or "Everyone dies someday, so it's not important."

Insko et al. (1975) focused on whether the individual perceived personal responsibility in the situation as indicative of another non-linkage belief.

That insight also helps one understand how Rotter's (1966)

"locus of control" construct or Hochbaum's (1965, 1958, 1965) idea that people's beliefs about personal susceptibility might be considered forms of non-linkage beliefs that explain failure to change. In the first case, non-linkage occurs because the "external" personality type believes he or she does not control the health situation. In the second, the person believes that since he or she is not susceptible--e.g., "People like me do not get the AIDS virus--there is non-linkage.

In essence, such non-linkage beliefs act as "on/off" decisional switches. Theories on change would suggest that, all other things being equal, system tension that is potentially favorable to observable change in health behaviors can be produced by beliefs or by conflicts either between beliefs or between beliefs and behaviors. However, non-linkage cancels out the tension.

OPERATIONALIZATION OR INTENTION BELIEFS: One of the early lessons emerging from propaganda and persuasion efforts in wartime was that even if individuals are convinced of the soundness of some premise, they might not act on it, simply because they don't know what to do next. Marketing and advertising communicators were quick to capsule this with the Attention-Interest-Desire-Action (AIDA) persuasive copywriting format: The last "A" reminds the communicator to "tell them what action is appropriate."

McGuire (1980) comments on the need in health communication to communicate specific information about how to

implement recommended health behaviors. And Fishbein & Ajzen (1975) see "intention"--having a plan for specific actions to implement--as intervening between behavioral analysis processes and the emitting of a behavior.

Consequently, it is possible that some percentage of persons in a client system will fail to implement health-change behaviors because they do not have beliefs about what steps or behaviors would logically obtain. Researchers, communicators, educators and planners too often have difficulty empathizing accurately with persons who are have markedly different lifestyles or "life space" experiences, though focus group or depth-interviewing research often could serve as a counterbalance.

BELIEFS AND SELECTIVITY PHENOMENA: Attitudinal predisposition, educational level, and utility--i.e., uses and gratifications--have been used to explain why people selectively expose themselves to information (Sears & Freedman, 1967; Davison, Boylan & Yu 1974, pp. 131-157). However, a test of a theory is whether it offers better explanation than other opposing theories. In this case, selectivity is better explained by Value-Expectancy Theory, drawing upon Lewin.

That is, the probability is greater that a person will seek or expose himself or herself to information when there is belief that the information is instrumental in relation to some valenced outcome or outcomes.

MEASURING BELIEFS IN RULES STRUCTURES: Formulation of effective change strategy is contingent in part upon targeting of beliefs that control the situation, so communications can be shaped to address them. That raises the question of methodologies that are available for measurement, due to the fact the planner needs to identify outcomes or rewards that individuals associate with health behaviors and the psychological valences (importances) that they assign to them. This points to the need for a methodology to ascertain whether the individuals believe health advocacy messages directed to them will produce the desired outcomes.

One methodological approach is examplified by Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980). Another is exemplified by Simmons (1987) in a study of smoking motivation, evolving from earlier work by Hesketh, Simmons and Marques (1978).

It is sufficient here to illustrate the potential of measurement to (1) differentiate the valences (importance strengths) of outcomes or rewards, over-all, and (2) differentiate them in particular audience segments. The example in Table 1 is drawn from Simmons (1987) relating to differentiation of reward, over-all. All valences for rated outcome factors are significantly different from zero at the .05 level.

Table 2 shows how the methodology can differentiate audience segments by mean valence ratings for outcome factors.

TABLE 1: First-Order Motivational Outcome Factors With Valence Weights and Reliability Coefficients

Outcome Factor Content	Mean Valence	Std. Error	R
Assertiveness	8.729	.098	.85
Self-Confidence	8.657	.113	.86
Independence	8.338	.106	.75
Self-Control	8.266	.115	.79
Personal Presentation	8.250	.139	.91
Behaving Responsibly	8.177	.123	.80
Affiliation Need	8.105	.111	.73
Affiliation Need (II)	7.994	.117	.80
Feeling Fresh, Rested	7.839	.143	.88
Work Efficiency	7.801	.140	.88
Personal Rewards	7.800	.129	.77
Money Management	7.793	.126	.60
Efficiency	7.757	.133	.83
Avoiding Fire Hazards	7.669	.197	.87
Odor-Free Environment	7.543	.182	.89
Group Problem-Solving	7.507	.141	.91
Group Acceptance	7.506	.133	.83
Organization	7.475	.139	.82
Environmental Sensitivity	7.431	.162	.92
Positive Health Behavior	7.272	.158	.86
Environmental Cleanliness	6.871	.165	.89
Money Management (II)	6.842	.154	.82
Controlling Stress	6.613	.179	.88
Organized Lifestyle	6.193	.160	.67
Physical Well-Being	6.008	.195	.81
Social Competence	5.935	.162	.66
Weight Control	5.856	.218	.79
Substitute Satisfactions	4.418	.167	.71
Pleasure Enhancement	4.321	.158	.77

NOTE 1: Statements within factors were rated by subjects on a scale from 0 (no importance) to 10. The grand mean constitutes the mean valence weight for each outcome factor.
NOTE 2: "R" above indicates a split-half reliability test. The Horst formula is used when scales have odd numbers of items; in cases of scales with even numbers of items, results are comparable to the Spearman-Brown formula (Guilford, 1954, pp. 378-79).

TABLE 2: Valences (Strengths) of Motivational Outcomes Related to Smoking/Nonsmoking in 2 Segments

Outcome Factor	Male Valence (n=40)	Female Valence (n=98)	2-tail "t" (df=137)
01 Feeling Fresh, Rested	7.5000	8.0170	-1.63
02 Self-Confidence	8.2208	8.8690	-2.69**
03 Work Efficiency	7.7250	7.8605	-0.44
04 Organization	7.0208	7.6327	-1.99*
05 Behaving Responsibly	8.1792	8.2058	-0.10
06 Affiliation Need	7.6500	8.3265	-2.87**
07 Positive Health Behavior	6.7300	7.4878	-2.17*
08 Assertiveness	8.6053	8.7908	-0.87
09 Self-Control	8.0333	8.7908	-1.27
10 Independence	8.2143	8.4067	-0.84
11 Group Acceptance	7.3708	7.5867	-0.74
12 Money Management	6.4667	6.9745	-1.51
13 Group Problem-Solving	6.9292	7.7959	-2.86**
14 Controlling Stress	6.4607	6.6662	-0.51
15 Environmental Sensitivity	7.1542	7.5272	-1.03
16 Weight Control	4.3417	6.5017	-4.86**
17 Physical Well-Being	6.2300	5.8959	0.77
18 Personal Rewards	7.5500	7.9133	-1.29
19 Pleasure Enhancement	4.2375	4.2857	-0.14
20 Social Competence	5.8400	5.9163	-0.21
21 Environmental Cleanliness	6.6167	6.9711	-0.96
22 Substitute Satisfactions	3.6900	4.7408	-2.78**
23 Organized Lifestyle	5.8438	6.3240	-1.34
24 Avoiding Fire Hazards	7.8500	7.5694	-0.84
25 Odor-Free Environment	7.1563	7.6888	-1.33
26 Efficiency	7.1650	7.6888	-2.75**
27 Affiliation-Need	7.4583	8.2585	-3.22**
28 Personal Presentation	7.6900	8.4776	-2.58*
29 Money Management	7.2950	7.9918	-2.53*

NOTE 1: Statements constituting the factors were rated by subjects on a scale of 0 (no importance) to 10. The grand mean constitutes the mean valence weight for each outcome factor.

NOTE 2: *$p \leq .05$; **$p \leq .01$

Tests of differences between the pairs of mean valences were statistically significant in regard to 11 of the outcomes or rewards.

In each case, women in the sample assigned higher valences: self-confidence, organization, affiliation need, positive health behaviors, substitute satisfactions, affiliation need, personal presentation and money management. Where there are no statistical differences between pairs of ratings, it indicates males and females assigned virtually the same valence to the outcome or reward.

The information above is illustrative, and deals with only segmentation by gender. However, the technique also was proved able to differentiate smokers, nonsmokers and former smokers in regard to several dimensions (see Simmons, 1987).

In summary, theory-based methodology already makes it possible to go past an intuitive or empathic approach to a structured procedure for identification of factors with their empirically based valence weights, derived in specific target population segments. Furthermore, it provides for use of multiple items to measure outcome valence dimensions and multiple-category responses, which tend to enhance reliability.

INFLUENCES OF OTHER SOCIAL SUBSYSTEMS

Although it is a virtual truism that people (i.e., subsystems) are affected by other people (i.e., other subsystems in a larger systems context), systems theory helps

focus on the explanatory rules as they bear upon health communication or education and behaviors.

One perspective is that there are system maintenance problems that generate different rules--some evolve to meet the objectives of the particular system, and others relate to jointly held objectives.

If either an individual or if a group of individuals with common characteristics or objectives is considered as a subsystem, other social subsystems (i.e., groups) may be instrumental to system maintenance processes: for example, meeting needs for "belonginess" and social approval; social definition of reality, where objective reality is not clear; orientational feedback--much like the Freudian notion of reality-checking; risk-assessment; and functional needs for information, considering that the shared knowledge and problem-solving resources of linked systems are usually greater than any system operating by itself.

External systems also can impose real or psychological restraints on the individual system. For example, the drug-abuser might decide that seeking drug treatment is advisable, only to be find that course of action is not possible because the federal government has cut funding for methadone programs, resulting in fewer vacancies and longer waiting periods. Other examples: Hospitals that are confronted by budgetary restraints may establish admission or treatment policies for persons who are unable to pay for medical services, or administrators may

be confronted by other program needs that are judged to have higher priorities in the face of economic scarcity.

A subsystem also has rules that establish the order of valences, or strengths of importance, that will govern relationships with external, linked subsystems--usually judged according to affective or functional criteria. Which is to say that some reference groups are more important, and potentially more influential, than others because of the rules in the particular client subsystem.

Other linked subsystems, such as individuals or groups, have their own concerns with the furthering of objectives that they hold to be important, which usually entails the mobilizing and manipulation of resources (e.g., often meaning persons who comprise linked subsystems). Such systems have implicit rules about deviancy and conformity (which outside of systems theory might be called norms), as well has how to gain compliance (e.g., Cohen, 1964, pp. 81-120).

Some of the other linked subsystems that often are discussed in the literature as "opinion leaders" should be differentiated insofar as whether they serve mainly as information brokers or attempt to set objectives that will be adopted by other systems (a literature review by Weiss, 1968, elaborates on intent to influence). Where objectives do include attempts to influence, client systems evidently invoke homophily and heterophily (Rogers & Shoemaker, 1974) rules as well as rules categorizing expertise or authoritativeness to

evaluate confidence and risk factors.

UTILIZATION OF MANAGEMENT CONCEPTS

The potential for diminished impact from the AIDS information campaigns is illustrative of structural problems in the planning of not only eduction and information campaigns on AIDS, but health campaigns in general. In the AIDS epidemic, there has been a veritable explosion of ad hoc efforts. In the rush to get warning messages ready to distribute to the public, the communication effort has, in the main, seemed to ignore what has been learned from decades of experience with communication program management as well as both general communication theories and others related specifically to health behaviors.

In particular, there is a need to conceptualize campaigns in terms of:

- Information need-assessment, to determine priorities for the allocation of resources.
- Segmentation, to ascertain the "boundaries" that differentiate target populations.
- The client system or subsystems' rule structures that control the problem under consideration.
- Managerial or instructional systems design structure, such as Management By Objectives (MBO) or behavioral objectives, to ensure that health communication messages do, indeed, relate to the critical behavioral and motivational variables, as discussed above.
- Evaluation, to enable planners to assess programs or experiments in the field in relation to impacts in the target audience both during interim periods and at the conclusion.

SEGMENTATION: Various fields that use communication for applied problem-solving have become increasingly aware that the design and delivery of messages for "the masses" is less effective than similar activities that address specific concerns within particular segments of the masses (for basic principles of segmentation, see Barban et al., 1976).

Segments tend to be relatively more homogeneous and also differentiated from other segments in terms of the rule structures regarding health behaviors. Therefore, needs or concerns relating to KAP variables and motivational variables tend to be relatively homogeneous within a subsystem but differentiated across subsystems. Some segments tend to be differentiated substantially from others in terms of idiosyncratic or non-standard language patterns--in fact, language use is actually used intentionally by some segments to distinguish themselves and create their own group boundaries.

The ad hoc mass education campaign in the United States about AIDS was not centrally planned or coordinated, prior to initiation of the U.S. Centers for Disease Control's official national campaign in October 1987. The majority of the effort has been polycentric in conceptualization, planning and execution. Although some messages come through relatively consistently--AIDS is fatal, indiscriminate sexual activity can lead to infection as can use of non-sterile needles by drug

abusers, condoms provide relatively (albeit not 100 percent) effective measure of protection, and everyone could be at risk--there is "informational clutter." The NCHS research and anecdotal evidence suggest there still is uncertainty in the public about how AIDS is spread--with unrealistic fears of infection through casual contact persisting. There is an ambivalence, especially among teen-agers and youth in their twenties, toward actual changes in sexual behavior.

Moreover, messages often are not specific enough in content, do not communicate in the audience's language, or do not deal with health beliefs of the population segments that are at higher risk.

The goals of AIDS information and education campaigns should be to help individuals (1) determine whether or to what degree they are at risk, (2) recognize the factors that cause the risk, and (3) understand how to control the risk.

Due to the fact that the U.S. Centers for Disease Control is the principal U.S. reporter of epidemiological trends, it might be assumed that the CDC would be especially sensitive to needs for the official U.S. AIDS campaign, which it sponsors, to focus on segments in which AIDS spreads most rapidly. That is not the case.

The CDC specified in its solicitation for bidders to conduct the official U.S. AIDS campaign that it must be directed primarily to a "general public."

The CDC advised bidders that homosexual persons engaged in high-risk behaviors were not to be addressed separately in the national campaign or given more attention in message or message-delivery planning. Moreover, illicit users of intravenous drugs or sexual partners of those persons were not mentioned at all.

The CDC guidelines provide that young people be given attention as a separate population segment. There is reasonable logic in that position.

Since segmentation strategy determines what communications channels are appropriate--i.e., proved, insofar as possible, to reach the target segment or segments--there are major questions about whether persons who are at high risk of HIV infection will be reached, especially those among the poor in the inner cities. There also are communication problems in low-income, low-education segments concerning illiteracy and use of nonstandard forms of language that tend to not be addressed when segmentation strategy is not employed.

MANAGEMENT BY OBJECTIVES: All organizations deal with efforts that must attain relatively specific outcomes (end-results). The desired outcomes usually are defined in terms of either "goals" or "objectives," which are subordinate to goals. A major management technique that is based in the specification of intended outcomes is called Management by Objectives (MBO).

MBO (for an overview, see Mager, 1977; Colley, 1964); Nager and Allen, 1986) addresses the need for managerial efficiency. Resources are finite. Consequently, because managers and planners operate under the constraint of finite resources, they must identify the most time- and cost-effective ways to utilize human resources, materials and capital to fulfill goals or objectives.

Communication campaign or project planning is no exception to those rules. Systematic planning is essential and must address six general management needs. If a campaign or project planner is to be effective, he/she must have:

- An objective system--that is, one that is capable of being presented to all concerned persons in writing--so that no one will have any doubt about what must be accomplished.
- A method that requires the statement of objectives and specific observable or measurable outcomes that must be produced by campaign messages by the conclusion of the campaign or project.
- A system that, once objectives are specified, will ensure that the messages that are designed will have a high probability of bringing about the designated end-of-project outcomes.
- A system of task objectives that facilitates work-delegation by expressing in unambiguous terms what tasks you expect to be completed by subordinates who will execute the work. Subordinates also benefit from clear statements about (a) what they must produce and (b) the criteria that will be used to judge whether the outcomes they produce are satisfactory--e.g., in relation to implementation of the information or education plan.
- A system that will make it possible for the planner to conduct a structured evaluation to determine whether outcomes--e.g., the messages--produced by subordinates meet stated objectives.

- A system that will make it possible for the planner ascertain (a) whether the communication campaign or project produces the intended outcomes in the target audience segment or segments and (b) whether the outcomes can be attributed to the project rather than to other forces in the environment.

Unfortunately, ad hoc planning does not meet those needs in most cases.

In general, Management by Objectives involves:

(1) Defining the general outcomes that must be produced by the project. Those are called global objectives.

(2) Defining the specific, measurable or observable outcomes that must be attained. Those are called terminal objectives.

(3) Defining the task outcomes or end-points of "doing" activities that must be completed by workers in order to attain the global and terminal objectives. Those are called intermediate objectives.

Terminal objectives are extremely important because they (1) are evolved from the behavioral and motivational analyses within specified audience segments amd (2) will control message design and eventual evaluation.

Terminal objectives objectives state what specific standards must be met at the end of the campaign or project to prove its success or degree of success.

The standards must be stated in either observable or measurable terms. They may deal with either quantitative or qualitative characteristics.

If the terminal objectives that are stated do not deal with observable outcomes. the planner must think of some way to transform them so they will be observable or measurable.

Fortunately, many communication campaigns or projects are designed to produce objectively demonstrable outcomes such as implementation of specified practices. Consequently, they lend themselves to fairly easy formulation of terminal objectives.

However, the criterion about finding a way to turn certain outcomes either observable or measurable arises when campaigns or projects deal with subjective outcomes such as "knowledge," "affect" (feeling), or "belief."

EVALUATION RESEARCH

Evaluation research that is based upon Management By Objectives provides a methodology for assessing the results of particular campaigns.

Terminal objectives evolve from research and behavioral strategy regarding the target audience segment or segments. They form the basis for message elements. Then, terminal objectives that have been specified earlier can be tested in the target audience segment or segments for which they designed. (For an example of the systemic integration, see Figure 1.)

Unfortunately, however, few if any of the ad hoc campaigns against AIDS that have been conducted to date evidently have incorporated evaluation, particularly MBO-based evaluations.

FIGURE 1: Systemic Relationships in Planning
--MBO, Message Plan and Evaluation Criteria

MBO TERMINAL OBJECTIVES

Members of the target audience will express agreement with the following:

- The AIDS virus is not known to date to be transmitted by social contact, including by the following means:
  (1) Sneezing or coughing
  (2) Shaking hands
  (3) Kissing
  (4) Sharing of eating utensils.

- The AIDS virus is not known to date to be transmitted by mosquitoes.

- The AIDS virus is not known to date to be transmitted by contamination of toilet seats.

COPY POINTS TO BE INCORPORATED IN MESSAGES

In approximately seven years of experience with the virus that causes AIDS, world reports on epidemiology have not revealed even one case of HIV infection caused by:

- Sneezing or coughing. Reason: The virus that causes AIDS is not airborne.

- Shaking hands. Reason: The virus is spread through the exchange of body fluid, which does not occur under normal conditions while shaking hands.

- Kissing. Reason: Although the AIDS virus is known to exist in the saliva of infected persons, the evidence is that transmission does not occur, due to the facts that (1) the amount of virus is extremely limited and (2) chemical properties of saliva are believed to make the virus less viable. Caveat: If a non-infected person has bleeding gums and kisses a HIV-carrier, there might be some element of risk, however small.

- Sharing of eating utensils. Reason: In no case where family members are caring for an AIDS victim has anyone known to have become infected, though they share eating utensils. The AIDS virus is not known to be viable on exposed surfaces, and high temperatures such as experienced during dishwashing evidently kill the virus.

- Mosquitoes. Reason: In lab experiments, the AIDS virus has not found to be viable within mosquitoes. The reason is that the mosquito as host does not provide the body temperature range needed for the virus to survive.

- Toilet seats. Reason: The AIDS virus is not known to be viable on exposed surfaces. Moreover, disinfectants used in cleaning kill the virus.

(CONTINUED ON THE NEXT PAGE)

FIGURE 1 (CONTINUED)

OPERATIONALIZATION OF EVALUATION RESEARCH CRITERIA

Respondents will be asked to respond to a series of declarations about transmissibility of the AIDS virus, in terms of the following categories: (1) Disagree Strongly, (2) Disagree, (3) Don't Know/Uncertain, (4) Agree, (5) Agree Strongly. Despite whether the declarations are stated in positive or in negative form, the respondents should, when the scoring is corrected for direction, essentially demonstrate correct knowledge. A score of "5" will be given for the most correct answer. (NOTE: The correct answers that are expected if the objectives are met are marked below with a letter "X.")

The measurement items would take the following form:

I am going to read you a series of statements about how people might or might not become infected with the virus that causes AIDS. Tell me whether you Agree Strongly, Agree, Disagree or Disagree Strongly with each statement. If you Don't Know or are Uncertain, please tell me.

- The AIDS virus can be spread by casual social contact--that is, everyday type of activities conducted in public.
  [ ] Agree Strongly [ ] Agree [ ] DK/UN [X] Disagree [X] Disagree Strongly

- Sneezing of coughing cannot spread the AIDS virus.
  [X] Agree Strongly [X] Agree [ ] DK/UN [ ] Disagree [ ] Disagree Strongly

- The AIDS virus can be spread by shaking hands.
  [ ] Agree Strongly [ ] Agree [ ] DK/UN [X] Disagree [X] Disagree Strongly

- The virus that causes AIDS can be spread by kissing.
  [ ] Agree Strongly [ ] Agree [ ] DK/UN [X] Disagree [X] Disagree Strongly

- The sharing of eating utensils cannot spread the AIDS virus.
  [X] Agree Strongly [X] Agree [ ] DK/UN [ ] Disagree [ ] Disagree Strongly

- The AIDS virus can be spread by mosquitoes.
  [ ] Agree Strongly [ ] Agree [ ] DK/UN [X] Disagree [X] Disagree Strongly

- The AIDS virus can be spread by toilet seats.
  [ ] Agree Strongly [ ] Agree [ ] DK/UN [X] Disagree [X] Disagree Strongly

In too many campaigns, where changes have been noted (e.g, Fineberg, 1988), the assumptions as to what phenomena brought

about the changes are problematic. First, without the MBO structure, it is virtually impossible to determine which messages were effective and which were not. Second, there is a substantial problem with "confounding" effects (see Kerlinger, 1973, pp. 300-326), such as the number of campaigns or education programs operating concurrently in the environment and other factors, such as personal motivation.

CONCLUSIONS

The conceptualization of the health research agenda, especially as it relates to a major concern like the AIDS epidemic and the social system and subsystems' urgent needs for surveillance and corrective information, too often does not go beyond relatively simplistic models.

There also is a tendency to report aggregate findings for an entire social system as though they reflect what is going on in subsystems where the problem might be much more severe.

An example is the National Center for Health Statistics (NCHS) report mentioned earlier. What the public or planners know after reading the initial report summary cannot be generalized to either the subsystems in the larger social system that are at highest risk of HIV infection or to those in other subsystems that might be vulnerable to HIV contagion.

Moreover, simple research or analysis schemes do not shed light on reasons why information suggests there is such a discouraging degree of misinformation about HIV spread through

means such as social contact--misinformation that contributes to dysfunctions such as aggressive behavior and discrimination against AIDS victims and HIV carriers or suspected carriers.

There also is a question of how much impact the mass-communicated health information or education messages are having on behavior change. Despite the thrust of Horn (1966, 1976) and others--including the various health belief and belief-based motivation models--the main thrust in research planning has been "business as usual": that is, the activities carry on with "knowledge surveys," "opinion surveys" and "attitude surveys." Moreover, where data are collected about "health behavior change," self-reporting measures may overlook specific questions in favor of generalized questions that are quicker and easier (and perhaps less embarrassing) to administer. The "halo effect" very likely inflates self-reporting of both health issue concern and health behavior changes. Moreover, questions about discontinuation of practices are rarely factored into the research design.

Additionally, anecdotal reports suggest that persons who led to believe erroneously that they are at risk needlessly (1) are alarmed, (2) may implement behaviors that are not appropriate to their condition and (3) burden physicians, hospitals, clinics and health providers with added traffic, which takes away time from those who need it most and raises medical costs.

Systems theory is advanced here as an option that can lead to a more systematic research agenda. It differs from another potentially useful applied model (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) in that it puts more stress on determining the belief-based rule structures that control information-processing and behavioral change and also provides good potential for use of those rule structures to explain health information-seeking, information-processing, and change processes.

One of the big drawbacks of systems theory in regard to the applied needs of communication practitioners, educators, planners and researchers in all communication fields, including health, is that the basic theory was not articulated to insist that the internal logic of a particular system and its subsystems could be mapped systematically and explained. The main thrust of this paper has been to make that point and suggest directions regarding rule structures that are likely to be critical.

The mapping of the rule structures is of almost paramount importance. Where subsystem processing of health information or implementation of health behaviors might seem illogical to one who is an outsider to the system under examination, the rules help the outsider understand that there is usually some logic--at least in the client system's views. The health communicator or educator needs to identify and work with those rule structures: that is a precondition for success.

For example, the misinformation about the potential for spread of the virus that causes AIDS might result from a lack of information. However, it is much more likely that the explanation is based in a rule structures that do not differentiate "plague-like diseases."

Furthermore, when the rules that control activities in a client subsystem are identified, it is possible to tailor health messages more appropriately--at least at a minimum addressing valenced outcomes and instrumentality beliefs concerning health issues in the client subsystem, which should work with selectivity processes rather than giving them benign neglect.

Also, the evidence about non-linkage problems suggest the need to investigate the individual client systems' rules to formulate a strategy to invoke change. If susceptibility or locus of control is found to be the controlling rules, that might suggest a strategy of jointly emphasizing susceptibility due to the nonfunctional behavior and responsibility or being "in charge." If non-linkage is due to actual lack of control, such as lovers of IV drug users who are reluctant to insist on regular use of condoms because they have no support infrastructure and are afraid of being beaten or abandoned, that might suggest a need to inform members of the client system about such things as shelters, social support programs and legal rights.

Where assertions are made that public health mass communication or education programs have led to change, there is some question whether the results might be more appropriately attributed to (1) personal motivation to seek or receive, process and act on available information in the face of a major health problem like AIDS, or (2) social communication or influence among concerned peers (e.g., others within a particular subsystem) or others in linked subsystems (e.g., doctors, clinic workers, street workers, public volunteer organization personnel, etc.).

Systems theory, and especially the notion of rules, helps clarify which other linked systems (mass media, health professionals, church groups, public volunteer organizations, family, etc.) are instrumental to (1) health information diffusion, (2) influence processes and (3) health behavior change. The mapping of rules can help illuminate what affective and functional needs are involved and what valences the client system assigns to the other linked system. The Norton & Hughey (1987) study of Memphis homosexuals' assessments of linked systems' potential for informing and the trustworthiness of information that those systems could provide vis-à-vis the AIDS epidemic is illustrative.

Moreover, the taboos imposed by various ones of the linked social subsystems that inhibit frank discussion of sexual behaviors make it difficult if not impossible to deal publicly with specific information that is essential to adequate

understanding in client subsystems about how to manage health problems--e.g., in the discussion of "safer sex" practices it is rarely clarified that (1) membrane condoms are not proved to be barriers against the virus that causes AIDS, while latex condoms are relatively safe; (2) latex condoms have a breakage rate of 10-15 percent during heterosexual intercourse, and (3) breakage of latex condoms during anal intercourse ranges up to 50 percent and (4) as Feinberg (1988) explains, intermittent use of condoms during episodes of intercourse dramatically decreases the protection against risk from any sexually transmitted disease (STD).

Additionally, the systems approach points to the need to consider how external system processes, such as politics and economics, affect the context of individual system health options or perceptions of options.

Now, what can be learned from the discussion above about particular deficiencies in the current AIDS campaigns in regard to health communication and management theory?

• Effective health communication demands application of segmentation principles. It can be proved methodologically audience segments can be differentiated according to outcomes or rewards--e.g., in Tables 1 and 2 above. Some of the differences between segments' rating of outcomes' valences are statistically significant. The differences are attributable to rule structure differences in client subsystems.

• The previous finding has tremendous implications for communication strategies or messages. Those that do not take cognizance of the client system or systems' rules regarding motivating outcomes and their differing importances are likely to address outcomes that have relatively less impact or no impact. Moreover, it follows that universal appeals to motivation are less likely to be successful than appeals targeted to those motivating outcomes that are specific to the target segments.

• Understanding the motivational interests of any target audience segment also can guide the communicator toward ways of shaping message appeals so they will seem to persons in the segment to be both relevant and compelling. That is called message positioning. Good positioning improves the probability that members of the segment will expose Themselves to the message, process the content and act.

• Segmentation also calls attention to the fact that target audience segments do not always use a standard form of the prevailing language. In discussing AIDS, for example, it has been found that adolescents often do not understand the clinical or technical terms for parts of the body or sexual functions (Strunin, 1988). Similar problems can be predicted among inner-city residents, particularly blacks and Hispanics, and intravenous drug abusers.

There are additional problems for planners. Failure to utilize segmentation can be dysfunctional, causing low-risk

segments of a population to experience high degrees of alarm. Resulting tension can increase the probability of social persecution of suspected or known AIDS virus carriers or even contribute to suicides among persons who misinterpret symptoms and panic due to anticipation of AIDS-inflected ravages of the body and death.

Structured, scientific assessment of the health communication problems among minority groups that are at high risk and among IV-drug abusers is either nonexistent or virtually nonexistent in the public domain. The paucity of campaign efforts targeted minority segments has brought about protests. For example, black leaders have expressed concern over the lateness of the start and the apparently limited concern over AIDS education for minorities (Boston Globe, 22 March 87, p. 26).

Utilization of Management By Objectives can help ensure that (1) messages that are created for target audience segment or segments will conform to the behavioral strategy and that (2) results in the specified target audience segment or segments will be easier to evaluate, because they have been specified objectively in the terminal objectives, and those objectives can be used to structure data-collection and analysis efforts (refer to Figure 1 sections on copy points and measurement operationalization).

Use of MBO-based planning would have made it very easy to determine whether the misinformation about HIV contagion cited

in the National Center for Health Statistics study, cited earlier, might have resulted due to the fact planning strategy did not cause objectives to be specified and, consequently, messages were not created and delivered.

As for evaluation research: structured, scientific evaluations of health campaigns in the AIDS epidemic are relatively rare, but should receive a high priority. They constitute a basis for improvement of the next generation of campaign efforts.

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